Livestock Grazing and Vegetative Management in the Big 6 Geographic Area

Species of Local Concern and Demand Species Specialist Report

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INTRODUCTION

This document analyzes the effects to the Species of Local Concern and Demand Species as identified in Appendix C of the Bighorn National Forest Revised Forest Plan (2005). Analysis for threatened, endangered, or Forest Service sensitive species (TES) is contained in the Biological Evaluation prepared for this project. Refer to the Environmental Impact Statement (EIS) prepared for this project for information on project location, setting, and proposed activities.

Rationale for selection of these species and the viability determinations for the species at risk (Local Concern) were analyzed in the Revised Forest Plan FEIS, to which this document is tiered to and incorporates by reference. The levels of management activity (e.g. prescribed burning, timber harvest, livestock grazing) assessed for the Forest Plan provide the context in which viability was analyzed, and this project falls within the level of activities analyzed. In addition, information and effects as portrayed for Demand species in the Revised Plan FEIS are also incorporated by reference. Individual species assessments for emphasis species prepared for the Revised Forest Plan and their supporting literature are also incorporated by reference, including any new Species Assessments generated from the Regional Species Conservation Project assessments. These documents provide details on habitat and potential effects from management activities. The Region 2 Regional Forester has updated the regional sensitive species list twice since the Forest Plan revision was completed, with the latest update occurring in June 2009. An errata (revised version) of Forest Plan Appendix C, dated January 15, 2010, revised the Bighorn NF list of sensitive species and the list of species of local concern to incorporate the regional sensitive species update. The January 2010 Appendix C list of species was used in preparing this analysis.

Information on species occurrences is from the Wyoming Natural Heritage Diversity Database (WYNDD), Forest Service botanical surveys, and annual observations by field personnel trained in botany or vegetation ecology. Forest Service botanical surveys were done in 2004-2009 for this project.

The activities listed in Table #3-1, of the EIS, were considered in the cumulative effects analysis for the following sensitive plant species. The cumulative effects boundary includes all the area within three miles of the project areas shown in Figure 1-1 of Chapter 1 of the EIS. The cumulative effects analysis is bounded in time from the first authorized livestock grazing, in 1906, until 5 years after the Record of Decision is scheduled to be signed, or September 30, 2015.

The three analyzed alternatives are:

Alternative 1 - No Action - No Livestock Grazing,
Alternative 2 - No Change – Livestock Grazing under Current Allotment Management Plans or Annual Operating Instructions

Alternative 3 Proposed Action – Livestock Grazing using Adaptive Management and, in addition, vegetative treatment in forest and sagebrush ecosystems.

These alternatives are described in detail in Chapter 2 of the Environmental Impact Statement

Revised Forest Plan Direction

Management direction (goals, objectives, standards, guidelines, monitoring) for emphasis species when implementing projects is found in the Revised Forest Plan. This project meets the goals and objectives by using adaptive management for livestock grazing, riparian protection measures, and vegetation treatment guidelines to improve plant communities. Surveys conducted for the project help to improve knowledge regarding emphasis species. Actions planned were designed to meet the standards and guidelines of the Revised Plan. These strategies and objectives were considered and addressed during the development of alternatives, design criteria, and monitoring actions.

The following **objectives** and **strategies** are those that most directly relate to project level design and analysis for emphasis species:

- **Objective 2.c: Improve the capability of the Bighorn National Forest to provide a desired sustainable level of uses, values, products, and services.**

Strategies

1. Livestock Grazing
    a. Provide forage for livestock while managing to meet desired conditions. Provide forage for livestock at a level that strives to maintain or exceed the year 2004 permitted stocking level of 113,800 Animal Unit Months (AUMs), while recognizing that stocking levels may be adjusted through the implementation of allotment management plans (AMPs) and administration of grazing permits. Annually adjust authorized stocking levels to assure that appropriate standards and guidelines are being met. As monitoring indicates it is needed, adjust permitted stocking levels to assure meeting or moving toward desired condition objectives in a timely manner. Authorize grazing of forage by domestic livestock that will maintain resource health while contributing to community lifestyle, tradition, culture, open spaces, and to the local economy. Strive to authorize grazing for domestic livestock that will provide stable livestock numbers and seasons of use.

- **<u>Objective 1.c:</u> Increase the amount of forests and rangelands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species.**

Strategies

1. Within 15 years, implement 447,052 acres[1] of vegetation management practices that will move all affected landscapes toward desired vegetation composition and structure. Vegetation management practices may include prescribed fire, wildland fire use, timber harvest, mechanical, biological, chemical, or cultural (e.g., livestock grazing) treatment, etc. Design management practices that maintain a mosaic of vegetative composition and structure emulating natural processes, patterns, scale, effect, and distribution of community types, age, and structure classes. Implement practices that attain the Desired Future Condition for forested age-class diversity as described in Chapters 1 and 3 of the Revised Plan. Emphasize the use of mechanical treatments on suited forested lands (Management Areas 5.11, 5.12, 5.13, 5.4, and 5.5). Acres treated may include or consider those listed in the strategies under Objective 1b (2) above.
2. Manage to retain or increase aspen stands by treating 500 acres over 10 years. Treatments include commercial and non-commercial harvests to remove competing conifer and regenerate aspen; prescribed fire; and fencing, where needed.
3. Place high priority on fuel reduction activities in Fire Regimes I, II, and III (ponderosa pine, sagebrush/grass, mixed conifer) and other strategic areas where high fire hazards exist, such as communities identified in the Healthy Forest Restoration Act (Federal Register, Vol. 166, No. 160, Aug 17, 2001) or as identified in community wildfire protection plans. Treatments should emphasize condition classes with one or more missed fire cycles and urban/wildland interface areas.

<u>Watershed</u>

- **<u>Objective 1.a:</u> Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial water uses.**

Strategies

1. Attain or maintain water quality necessary to comply with state of Wyoming water quality standards in all streams on the Forest. Water must be of sufficient quality to support state-designated beneficial uses and healthy riparian, aquatic, and wetland ecosystems.
2. Manage for the structural and compositional diversity of native plant

[1] These are distinct or individual acres. Many activities may have multiple entries, even annual entries such as grazing, but are only counted in this tally once.

communities in riparian zones and wetlands.

3. Maintain, protect, and enhance wetland function and value when analyzing or implementing all projects.

Species Diversity

- **Objective 1.b: Provide ecological conditions and habitat within the ecological capability and disturbance regimes of the Forest to sustain well-distributed viable populations of native and desired non-native emphasis species listed in Appendix C of the Revised Plan**.

Strategies

1. Incorporate published conservation strategies for species at risk (Threatened, endangered and sensitive species and species of local concern listed in Appendix C of the Revised Plan) into project design as they are developed, conducting plan amendments when or if necessary to incorporate management direction.
2. Proactively conserve populations of emphasis species at risk by maintaining or improving habitat availability and quality when designing projects based on species' habitat needs. Provide diversity in habitat structural stages of forested vegetation and age-class diversity of non-forested vegetation, as needed.
3. Provide adequate habitat to support populations of big game species according to population objectives developed in concert with the Wyoming Game and Fish Department. Treat 3,000 acres of big game winter range every 5 years to improve habitat value.
4. Maintain or increase the amount of elk (MIS) security areas at the forestwide scale. Current level is 47% of potential. Assess availability of security areas at the geographic area scale, and incorporate security area analysis into travel and vegetation project management decisions to increase availability, where feasible.
5. Maintain a forest wide system of old-growth habitat to sustain old-growth associated species and resources. Identify stands for each geographic area for management as old growth through remote sensing or field inventory. Prioritize field inventory of geographic areas where more widespread vegetation management treatments will be planned. Validate inventory of the Tongue River, Goose Creek, and Clear Creek/Crazy Woman Creek geographic areas by 2010.
6. Manage riparian and aquatic habitat, including springs and fens, to support well-distributed populations of native plant, invertebrate and vertebrate riparian- and aquatic-dependent species.

Biological Diversity Guideline 7, Forest Plan page 1-28:

> Maintain, or mitigate impacts to, important habitat types including alpine tundra; moss community in Dry Fork; bogs, fens, and springs (including Preacher Rock Bog and Willow Swamp[2] on Powder River District); talus slopes; cliffs; and rock outcrops.
>
> Within the project area, there are areas of tundra, bogs, fens, and springs that could be impacted by the alternatives. In general, the design criteria, including best management practices, utilization guidelines, and long-term benchmark monitoring will provide protection of these resources. Preacher Rock Bog is within the project area, but has a fence to preclude livestock grazing.

Species of Local Concern and Demand Species Analysis

The following tables provide an analysis of effects to species of local concern and demand species identified in the Revised Forest Plan. This document analyzes effects relative to the proposed action, except as noted, due to similarities among action alternatives. There would be no effects, other than ongoing continued cumulative effects, from the no-action alternative to any of the species listed below. Descriptions of how these species were selected are displayed in the Revised Forest Plan and FEIS. In general, Demand species are those species for which a public demand occurs, typically from a hunting/gathering perspective. Local concern species are those that may be locally unique or at risk based on state level heritage database rankings or other criteria, and yet do not warrant consideration as part of the Forest Service sensitive species list. Additional analysis beyond what occurred for Forest Plan revision, in terms of selection of these species and their limiting factors, has occurred at the Regional level, with factors displayed for recommending these species' consideration at the local (Forest level) scale.

[2] Refer to Appendix A of the Revised Plan for a location map of Preacher Rock Bog and Willow Swamp.

Table 1. Bighorn NF Local Concern Species - Habitat, Occurrences, Effects

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Musk root *Adoxa moschatellina*	Shady, moist, moss-rich limestone cliffs and cave entrances from 4,400-8,000'.	G5/S2	Potential habitat and one known occurrence within the project area in Leigh Creek.	Due to the shady moist areas, ruggedness and inaccessibility by livestock to the species habitat and known occurrence, there should be no direct or indirect effects due to grazing or vegetation treatment. This project would not increase cumulative effects. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Aromatic pussytoes *Antennaria aromatica*	Open slopes & ridges, limestone talus at or above timberline. May be found at elevations from 4,500-11,000'.	G3G4/ S2	Limited potential habitat, and no known occurrences in project area. The nearest known location is approximately 2 miles north of the project area at 8,000'.	Due to the lack of species occurrences and limited potential habitat, there should be no direct and indirect effects from grazing or vegetative treatments. The one known location on forest is located on steep talus slopes not accessible by livestock. Similarly, there should be no increased cumulative effects to this species from the project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Pygmy pussytoes *Antennaria monocephala*	Wind swept, open slopes, ridges in alpine or subalpine tundra	G4G5/S1	Known habitat, but no known occurrences, in project area. The one known location on forest is in Cloud Peak Wilderness at approximately 10,200 ft immediately adjacent to Tensleep project area.	The known habitat is adjacent to the one known species occurrence on the forest. Alternative 1 and 2 would have no effects because there would be no livestock grazing or fire, under the no grazing and current management alternatives. Alternative 3 would allow for livestock grazing on the Willow and McClain Lake S&G allotments, however due to the inaccessibility of the terrain at the known habitat, domestic sheep would have no direct or indirect effects. No fires are proposed in the known location. There would be no increased cumulative effects for this plant from the project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Lance-leaved grapefern *Botrychium lanceolatum*	Riparian areas, organic rich hummocks from 7,700 – 8,800'	G5T4/S1	Potential habitat in project area. Two known occurrences on forest and both are in the project area. One is at headwaters of North Beaver Creek, and the other is in the Tourist Rec Horse allotment.	Of the two known occurrences, only one has permitted use by domestic livestock and this use has been occurring since the early 1900's, with a reduction in livestock numbers occurring in the 1980's. Alternative 1 would have no effects. Alternative 2 is also expected to have no direct or indirect effects because this use has been occurring, with riparian guidelines having been met in the area in the past, and the habitat does not appear to be compromised. Alternative 3 would have adaptive management strategies in place for livestock grazing, however one of the strategies involves spikemoss (*Selaginella densa*) treatment in uplands that are adjacent to a known population of *Botrychium l.* and additional habitat. The BE for this project outlines in detail the spikemoss project and effects to *Botrychium ascendens and paradoxum*. The effects of the spikemoss treatment would be expected to be the same for other Botrychium spp. There should be no direct, indirect, or additional cumulative effects from this project (Big 6) under any of the alternatives. Due to the moist habitat which this species occurs, fire would have little to no effect as well. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Mingan moonwort *Botrychium minganense*	Wide variety: riparian, moist meadows, sand dunes, prairies, woods.	G4/S1	Limited habitat and one known occurrence in project area in proposed Mann Creek RNA. Two other occurrences exist on the forest outside project area.	While threats are unknown, livestock should have no direct or indirect effects to the plant or its habitat due to the location, ruggedness and inaccessibility of the terrain. No prescribed fires are proposed in the area. There would be no additional cumulative effects by this project. Small habitat size and numbers may make colonies vulnerable (WYNDD species abstract).This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Leathery Grapefern *Botrychium mulitifidum*	Wet meadows and bottomlands	G5/S2	At least 17 known locations on forest, 13 in Goose group of allotments.	This species occurs in at least 24 different states, and ranges from the N. Tongue watershed to Doyle Creek on the Bighorn National Forest. All of the known locations on the Bighorn have been subject to grazing, so this species has withstood the past 100+ years of grazing on the Forest. Trampling is considered to be more of a threat from livestock than is actual grazing, due to the habit and edibility of this plant. Fire is unlikely to carry through this habitat. Alternative 1 would likely have beneficial effects, as no further trampling would occur. Alternatives 2 and 3 would continue the risk of trampling, and the slight risk of grazing, but use guidelines and long-term monitoring are expected to continue to maintain viability of this plant on the Forest. The effects of spikemoss treatment would be the same as outlined above for B. lanceolatum. Cumulative effects would be from other grazing allotments on the Forest, which have the same, or similar, use guidelines and monitoring.
Rattlesnake fern *Botrychium virginianum*	Calcium rich, moist shady areas and limestone cliffs from 3,900-7,000’	G5/S2	Limited habitat and one known occurrence in project area in proposed Mann Creek RNA. No other occurrences known on Forest.	The effects would be similar for *B. minganense* This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Mud sedge *Carex limosa*	Wetlands, often in sphagnum bogs from 6,600 – 10,300’.	G5/S2	Limited potential habitat and one known occurrence on south end of Forest by Meadowlark Lake in project area.	Habitat in the project area is limited. Livestock tend to avoid very wet areas, and the one known occurrence is not in an area accessible by livestock Based on no project anticipated disturbances to bogs there should be no direct, indirect, or any increased cumulative effects from this project to potential habitat or the existing population. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Short-leaved sedge *Carex misandra*	Alpine wet meadows, willows, streambanks from 9,500' – 11,200'.	G5/S1	Potential habitat in project area and the one known location on forest is in project area near Lake McClain.	The known occurrence is within a vacant grazing allotment (McClain Lake S&G). Alternative 1 and 2 would have no effects because there would be no livestock grazing or fire, under the no grazing and current management alternatives. Alternative 3 would allow for livestock grazing on the Willow and McClain Lake S&G allotments, however due to the inaccessibility of the terrain at the known habitat, domestic sheep would have no direct or indirect effects. No fires are proposed in the known location. There would be no increased cumulative effects for this plant from the project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Leafy thistle *Cirsium foliosum*	Moist areas along roads, meadows, slopes at 8,000 feet.	G5/S1	Limited potential habitat in project area, but no known occurrences. Known from 1 location on Forest near 8,000' along Hwy 14A.	Potentially threatened by expansion of roads. The known occurrence is within an active grazing allotment outside the project area. Due to limited potential habitat and no known occurrences in project area, there should be no direct, indirect, or cumulative effects from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Fragile rockbrake *Cryptogramma stelleri*	Thin mossy soils in shady limestone cliffs near water.	G5/S1	Known habitat and one occurrence on forest is in project area within proposed Mann Creek RNA.	Livestock should have no direct or indirect effects to the plant or its habitat due to the location, ruggedness and inaccessibility of the terrain. No prescribed fires are proposed in the area. There would be no additional cumulative effects by this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
White arctic whitlow-grass *Draba fladnizensis var. pattersonii*	Fellfields and talus slopes above 10,200 – 12,000 feet	G4T2T3/ S2	Limited potential habitat and no known occurrences in project area. Two known locations on Forest in Cloud Peak Wilderness	The known habitat is adjacent to the one known species occurrence on the forest. Alternative 1 and 2 would have no effects because there would be no livestock grazing or fire, under the no grazing and current management alternatives. Alternative 3 would allow for livestock grazing on the Willow and McClain Lake S&G allotments, however due to the inaccessibility of the terrain at the known habitat, domestic sheep would have no direct or indirect effects. No fires are proposed in the known location. There would be no increased cumulative effects for this plant from the project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Woodland horsetail *Equisetum sylvaticum*	Wet meadows, marshes, streambanks, and moist woods, often on subacidic soils. Elevations range from 4,000-5,900 feet.	G5/S1	Potential habitat in project area and two known occurrences on forest. One occurrence is within project area in Preacher Rock Bog at about 8,200 feet.	There is known habitat and one occurrence within the project area within an active grazing allotment. Preacher Rock Bog is fenced, so there are no effects from the actions proposed under any alternative in this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Low fleabane *Erigeron humilis*	Granite and limestone cliff faces on moist mossy microsites above timberline.	G4/S2	Limited potential habitat and no known occurrences in project area. Known from 1 location on Forest in Cloud Peak Wilderness.	Threats are not known, but presumed to be low (WYNDD abstract). Due to the location, ruggedness and inaccessibility by livestock to the potential habitat, there will be no effects under any alternative. Due to the shady moist areas in which this species is located, fire would have no effects. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Howard forget-me-not *Eritrichium howardii*	Limestone outcrops and dry rocky areas from 7,600 – 9,000'.	G4/S1	Potential habitat and only known occurrence on forest is in project area, within potential Mann Creek RNA.	The one known occurrence is located on redbed clays on flats at the top of dolomite cliffs that are inaccessible to livestock. The habitat was noted to be in good condition (Fertig, 1996) and threats were low. Prescribed fires would pose no threat to this species, as fire could not carry through this rocky habitat. There would be no effects to this species under any alternative. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Three-flower rush *Juncus triglumis var. triglumis*	Wet gravel slopes below melting snows from 10,000 – 11,000'.	G5T5/S1	Limited potential habitat in project area due to elevation. Known from one location on Forest in Cloud Peak Wilderness just outside the project area.	The known habitat is adjacent to the one known species occurrence on the forest. Alternative 1 and 2 would have no effects because there would be no livestock grazing or fire, under the no grazing and current management alternatives. Alternative 3 would allow for livestock grazing on the Willow and McClain Lake S&G allotments, however due to the inaccessibility of the terrain at the known habitat, domestic sheep would have no direct or indirect effects. No fires are proposed in the known location. There would be no increased cumulative effects for this plant from the project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Watson's prickly-phlox *Linanthus watsonii* *(formerly Leptodactylon watsonii)*	Ledges and crevices in steep sandstone, limestone or dolomite cliffs from 4,600-6,100'	G3G5/S1	Known and potential habitat and one known occurrence on Forest in Leigh Cr area in project.	Due to the location, ruggedness and inaccessibility of livestock to the potential habitat and the one species occurrence, there should be no direct or indirect effects from grazing or prescribed fire. No additional cumulative effects are expected from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Northern twayblade *Listera borealis*	Moist, shady Doug-fir and spruce forests and streambanks from 6,300 – 11,000'.	G4/S2	While there is habitat within the project area, there are no known occurrences. The two known occurrences on the Forest are in the vicinity of Porcupine and Cookstove Basin.	There are not potential effects from fire, as the habitat would not carry prescribed fire. Potential effects from grazing in wet areas may occur, but because habitat is not heavily used by livestock, grazing impacts under alternatives 2 and 3 are considered to be very low to non-existent. Livestock grazing in other allotments and projects that increase the incidence of noxious weeds would add cumulative effects to this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species
Broad-leaved twayblade *Listera convallarioides*	Streambanks, lake margins, and moist, shaded areas in coniferous forest and moist, grassy areas under aspen and alder at 6,400 - 9,000'.	G5/S2	Limited potential habitat in project area. Known from 1 historic occurrence on Forest in Wolf Creek just outside project area. Other occurrence off forest in Story area.	The one known historic occurrence is not within an active grazing allotment, and is found on the east side of the forest within dense timber. The potential habitat adjacent to the known occurrence on forest is similar and there should be no direct or indirect effects from this proposed action. No additional cumulative effects are expected from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Sheathed musineon *Musineon vaginatum*	Chugwater redbed shale soils (under conifer) or limestone outcrops at 4,600-8,300'	G3?/ S2	Potential habitat and three known occurrences in project area. Known from seven locations on northeast portion of Forest.	Known habitat within the analysis area is found in both areas protected from livestock grazing and areas not protected. Invasive species area also present within the vicinity. It may also occur in the proposed Mann Creek RNA. Threats are unknown, but there is potential for direct and indirect effects from livestock and invasive species. Prescribed fire is also proposed under alternative 3 where one occurrence is reported. Cumulative effects from invasive species spread would occur, however under Alternative 1 livestock would not be a vector. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Alpine poppy *Papaver radicatum ssp. kluanense*	Alpine meadows, talus slopes and fellfields from 10,800 – 12,300'.	G3G4/S2	No potential habitat in project area due to elevation, and no known occurrences. 1 known occurrence on Forest in Cloud Peak Wilderness.	The upper elevations of the project area are about 10,000' and this species and its habitat are found at elevations well above this. There should be no direct, indirect, or cumulative effects from this project to this species or its potential habitat. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Mountain lousewort *Pedicularis pulchella*	Alpine meadows and alpine scree slopes above timberline at 10,300-12,460'.	G3S2	Limited potential habitat in project area due to elevation. Of the two known locations on Forest, one is in Cloud Peak Wilderness and not in a grazing allotment.	The majority of the project area is below 10,000' and this species and its habitat are found at elevations above this. Threats are not known, but due to the majority of potential habitat being inaccessible to livestock, it is anticipated that there would be no direct, indirect, or cumulative effects from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species. The reported location of this species along the western forest boundary is suspect, due to elevation outside published range.
White larchleaf beard-tongue *Penstemon laricifolius ssp. exilifolius*	Rocky calcareous hills and slopes with *Artemisia* spp. and/or *Pinus flexilis*. In Wyoming, it is found between 6,300' and 7,800'.	G4/S2	Potential habitat in the project area, with one occurrence known within project area on the southwest corner.	The known occurrence in the project area is within an active grazing allotment, while the Shell Canyon population is not in a grazing allotment. The habitat tends to be on the west slope of the forest. The known populations in Wyoming occur in areas of light livestock use. Livestock grazing has limited direct influence and may have positive and negative indirect influence (Heidel, B. 2007). There would be cumulative effects from projects that increase the occurrence of invasive plant species. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Large-leaved pondweed *Potamogeton amplifolius*	Slow moving streams and lakes from 7,820 to 9,400 feet, usually in deep water	G5/S1	Limited potential habitat and no known occurrences within the project area. One known location on Forest is in Cloud Peak Wilderness at Shird Lake	Limited potential habitat and no known occurrences exist in the project area. Due to location of species occupying deeper water, there would be no direct, indirect, or cumulative effects from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Wooly prince's plume *Stanleya tomentosa var. tomentosa*	Limber pine woodlands, juniper shrublands on limestone/ sandstone ridges, dry dolomite cliffs/talus at lower elevations.	G4T3/S2	Potential habitat within project area, but no known occurrences. One known location on Forest is near Shell Canyon RNA.	The known location is about 1 ½ miles south of the project area. The habitat within the project area is not readily accessible by livestock. No direct, indirect or additional cumulative effects would be expected from this project. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Hapeman sullivantia *Sullivantia hapemanii var. hapemanii*	Limestone outcrops and boulders in shaded limestone canyon streams from 3,200 – 8,200'.	G3T3/S3	Potential habitat and three known occurrences within the project area. Eighteen occurrences on the forest.	This species is currently found in active livestock allotments throughout the Forest, but the habitat for this species is generally inaccessible to livestock. There would be no direct, indirect, or cumulative effects. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

2005 Revised Forest Plan - Species of Local Concern - PLANT SPECIES

Species	Habitat	Status	Project Occurrence	Effects/Determination
Soft aster or Aster mollis *Symphyotrichum molle*	Granitic and sedimentary substrates in montane sagebrush meadows from 6,400-8,500'.	G3/S3	Potential habitat and several occurrences within project area. Thirty-four occurrences on the forest.	The majority of the species occurrences are within active grazing allotments. Low levels of herbivory do not appear to have negative impact (Fertig, 1999a). Prescribed fire may provide beneficial disturbances, as this plant has occurred with fire. Cumulative effects from invasive species may occur due to known invasive populations near occurrences. The Forest Plan considered this a low priority for further inventory and monitoring due to increased known distribution and lack of threats. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species

NSS = Native species status; state ranking; numbers 1 through 3 indicate those species recognized as high priorities for conservation action, with a 1 indicating possible extirpation.

PIF = Partners in Flight; state ranking; levels I and II identify species which may be of viability concern.

SSC = Species of special concern; derived primarily from the Fine Filter Analysis for the Bighorn National Forest (Welp et al 2000).

G = Global rank, based on the rangewide status of a species. **T** = Trinomial rank, based on the rangewide status of a subspecies or variety. **S** = state rank, based on the status of a taxon in Wyoming (state rank may differ in other states). **1** = critically imperiled because of extreme rarity or because of some factor of a subspecies' life history that makes is vulnerable to extinction. **2** = imperiled because of rarity or because of factors demonstrably making a species vulnerable to extinction. **3** = rare or local throughout its range or found locally in a restricted range. **4** = apparently secure, although the species may be quite rare in parts of its range, especially at the periphery. **5** = demonstrably secure, although the species may be quite rare is parts of its range, especially at the periphery. Source: Wyoming Natural Diversity Database (WYNDD), 4/29/05.

Table 2. Bighorn National Forest Demand Species – Habitat, Occurrences, Effects

2005 Revised Forest Plan - Demand Species

Plants

Species	Habitat	Status*	Project Occurrence	Effects/Determination
Sweetgrass *Hierochloe odorata*	Moist meadows, low prairies, edges of sloughs and marshes, bogs, fens, shaded streambanks, lakeshores, often at the forest edge and cool mountain canyons.	G5/S5	Limited potential habitat, and one known occurrence in project area near Meadowlark Lake. Nine locations known on Forest.	The one known occurrence in project area is within Tourist Recreation Horse allotment. It is thought to be more common on the forest than current inventories indicate. It has been reported as producing very little forage, and the main threat is over collection. It is anticipated that there should be no direct, indirect, or additional cumulative effects from this project to this species or its potential habitat. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.
Purple cone flower *Echinacea angustifolia*	Dry open prairies and plains on sandy soils	G4/S3	No potential habitat within the project area and no known occurrences on forest.	Occurs near the Forest boundary but has not been observed on the Forest despite searches. Due to a lack of potential habitat and no known occurrences, there should be no direct, indirect, or additional cumulative effects. This project would not change the conditions associated with the viability determination made in the Revised Forest Plan FEIS for this species.

Design Criteria and Monitoring:

Design criteria for invasive species, best management practices, long term trend monitoring at benchmark sites, and annual utilization monitoring, among others, have already been included as a 'package of actions' in Chapter 2 of the EIS. This entire package of actions will have beneficial impacts on plant species of local concern.

References:

Bighorn National Forest Invasive Species Action Plan. 2005. Bighorn National Forest. Sheridan, WY.

Bighorn National Forest. 2005b. Bighorn National Forest Rare Plant Field Guide, version 1.1.

Fertig, Walter. 1994. Wyoming Rare Plant Field Guide. Wyoming Natural Diversity Database. Laramie, WY.

Fertig, Walter. 1999a. The Status of Rare Plants in the Bighorn Landscape. Report prepared for The Nature Conservancy Wyoming Field Office. On file at the Bighorn National Forest and Wyoming Natural Diversity Database.

Fertig, Walter. 1999. Ecological Assessment and Monitoring Program for Northern Blackberry (*Rubus acaulis*) in Bighorn National Forest, Wyoming. Report prepared for the Bighorn National Forest. On file at the Bighorn National Forest and Wyoming Natural Diversity Database.

Girard, M. et. al. 1997. Classification of riparian communities on the Bighorn National Forest. USDA Forest Service. On file at Sheridan USFS office.

Heidel, B. and J. Handley. (2007, January 29). *Penstemon laricifolius* Hook. & Arn. ssp. *exilifolius* (A. Nels.) D.D. Keck (larchleaf beardtongue): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/penstemonlaricifoliussspexilifolius.pdf

Nelson, B.E. and Hartman, R.L. 1984. Flora of the Big Horn Mountains, checklist. Report prepared by the Rocky Mountain Herbarium, University of Wyoming, Laramie, WY.

Nesser, John A. 1986. Soil Surveys of Bighorn National Forest, Wyoming. USDA, USFS, and Soil Conservation Service in cooperation with Wyoming Agricultural Experiment Station

Popovich, Steve. 2008. Personal phone communication regarding status of Botrychium spp. in Region 2 and the Bighorn National Forest. Forest Botanist, Arapahoe/Roosevelt National Forest. Fort Collins, CO

Regan et al. 2004. Current Landscape Condition for the Bighorn National Forest Ecosystem. Rocky Mountain Region of the USDA Forest Service. Unpublished document on file at the Forest Supervisor's Office.

Todd, Lynn D. 1969. Preference and utilization trends by cattle on grass-forb vegetation in the northern Big Horn Mountains, Wyoming. M.S. Thesis. University of Wyoming. 73p. cited in Fisser, Herbert G. 1987. Wyoming Shrubland Ecology. Agricultural Experiment Station University of Wyoming.

USDA Forest Service. 2005. Various individual plant species reports and assessments on file in the Forest Plan record. On file at the Bighorn NF Supervisor's Office.

USDA Forest Service, 2009. Bighorn National Forest Rare Plant Management Strategy: 5 Year Action Plan, 2009-2013. On file at the Bighorn NF Supervisor's Office.

Welp, L, W. Fertig, G. Jones, G. Beauvais, and S. Ogle. 2000. Fine filter analysis of the Bighorn, Medicine Bow, and Shoshone National Forests in Wyoming. Wyoming Natural Diversity Database. University of Wyoming. Laramie, WY.

Williams, Tara Y. 1990. Botrychium paradoxum. In: Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2008, February 20].